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INTERNATIONAL PRELIMINARY EXAMINATION REPORT
(PCT Article 36 and Rule 70)

REC'D 24 MAY 2004

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Applicant's or agent's file reference khs-0190/pct	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/KR2003/000035	International filing date (day/month/year) 09 JANUARY 2003 (09.01.2003)	Priority date (day/month/year) 12 JANUARY 2002 (12.01.2002)
International Patent Classification (IPC) or national classification and IPC IPC7 B09B 3/00, C05F 9/02, C02F 3/12, B02C 18/40		
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1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.



2. This REPORT consists of a total of 4 sheets, including this cover sheet.

☒ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 5 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 14 JULY 2003 (14.07.2003)	Date of completion of this report 28 APRIL 2004 (28.04.2004)
Name and mailing address of the IPEA/KR  Korean Intellectual Property Office 920 Dunsan-dong, Seo-gu, Daejeon 302-701, Republic of Korea Facsimile No. 82-42-472-7140	Authorized officer KIM, Ki Yong Telephone No. 82-42-481-5975 

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/KR2003/000035

I. Basis of the report

1. With regard to the elements of the international application:*

☐ the international application as originally filed☒ the description:

pages 1-25

, as originally filed

pages , filed with the demand

pages , filed with the letter of

☒ the claims:

pages , as originally filed

pages , as amended (together with any statement) under Article 19

pages , filed with the demand

pages 26-29 , filed with the letter of 19/02/2004

☒ the drawings:

pages 1-8 (Fig. 1-11)

, as originally filed

pages , filed with the demand

pages , filed with the letter of

☐ the sequence listing part of the description:

pages , as originally filed

pages , filed with the demand

pages , filed with the letter of

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language which is

☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).☐ the language of publication of the international application (under Rule 48.3(b)).☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

☐ contained in the international application in written form.☐ filed together with the international application in computer readable form.☐ furnished subsequently to this Authority in written form.☐ furnished subsequently to this Authority in computer readable form.☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.4. ☒ The amendments have resulted in the cancellation of:☐ the description, pages☒ the claims, Nos. 2☐ the drawings, sheet5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this opinion as "originally filed." and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

** Any replacement sheet containing such amendments must be referred to under item I and annexed to this report.

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V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**1. Statement**

Novelty (N)	Claims	<u>1, 3-10</u>	YES
	Claims		NO
Inventive step (IS)	Claims	<u>4-10</u>	YES
	Claims	<u>1, 3</u>	NO
Industrial applicability (IA)	Claims	<u>1, 3-10</u>	YES
	Claims		NO

2. Citations and explanations (Rule 70.7)

Reference is made to the following documents:

D1: EP 0860407 A2
D2: JP 2000-233166 A
D3: JP 2000-202265 A
D4: US 5622617 A
D5: WO 01/15826 A1
D6: US 5710042 A

D1 and D2 are the closest prior art. Consequently, the present inventions are compared with D1 and D2 as follows:

1. Novelty (PCT Art. 33(2))

The ring blower and the pre-heater which are elements of claim 1 are not disclosed in D1, and the condenser of claim 1 is not disclosed in D2. Therefore, claim 1 has novelty over D1 and D2. Claims 2-3, dependent claims of claim 1, also have novelty.

The solid-liquid separator which is an element of claim 4 is not disclosed in D1 and D2. Therefore, claim 4 has novelty, and claims 5-6, dependent claims of claim 4, also have novelty.

The automatic cleaning system of claim 7 is not disclosed in D1 and D2. Therefore, claim 7 has novelty, and claims 8-10 dependent on claim 7 also have novelty.

2. Inventive step (PCT Art. 33(3))

The ring blower and the pre-heater of claim 1 correspond to the blower (10) and the heat-exchangers (15, 16) of D2, and the condenser of claim 1 corresponds to the cooling device (55) of D1. The arm blades consisting of an inner arm blade and an outer arm blade can be easily formed from the plates (43, 44) of D1 by a skilled person, because no special function of the

(See supplement box)

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Supplemental Box
(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of:

BOX V.

inner end plate and the outer end plate engaged to the ends of the inner and the outer arm blade is described in the description except for agitating and because the inner end plate and the outer end plate are regarded as only parts of the arm blades.

Therefore, a skilled person can make easily the invention of claim 1 by simply combining D1 and D2, and consequently claim 1 lacks an inventive step.

The cover of claim 3 dependent on claim 1 is disclosed in D1 and D2. Therefore, claim 3 is also considered to lack an inventive step.

3. Industrial applicability (PCT Art. 33(4))

Claim 1 and claims 3-10 have industrial applicability.

What is claimed is:

1. (Amended) An organic waste decomposition device, comprising:

a plate shaped base arm;

a cylindrical shell casing which is installed in the base frame and receive a

5 microorganism therein;

a shaft which is rotatably installed in a center portion of the shell casing;

a plurality of arm blades which are engaged to the shaft and are adapted
to agitate and crush the organic wastes[;].

wherein each arm blade includes a plurality of inner arm blades which
10 each has an inner arm plate having an end portion engaged to the shaft, and an
inner end plate engaged to the other end portion of the inner arm plate and
including a center portion bent, and which are installed at a regular interval with
respect to an axial direction of the shaft; and

an outer arm blade which includes an outer arm plate having an end
15 engaged to the shaft, an outer end plate engaged to the other end portion of the
outer arm plate and having a center portion bent, a sub-plate engaged to an upper
portion of the outer arm plate at a certain slanted angle, and an outer arm plate
installed at both ends of the shaft;

a driving motor which is adapted to provide a rotational force to the shaft;

20 a ring blower which is adapted to supply air into the interior of the shell
casing;

an air pipe which is adapted to connect the ring blower and a lower portion

of the shell casing;

a pre-heater which is installed in the air pipe and is adapted to pre-heat the air supplied into the interior of the shell casing;

a condenser which is adapted to liquefy a vapor discharged when an organic waste is decomposed in the interior of the shell casing and to discharge the liquefied vapor;

a steam pipe which is adapted to connect an upper portion of the shell casing and the condenser; and

a control box which is adapted to control the operations of the driving motor, ring blower and pre-heater.

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2. (Deleted)

3. The device of claim 1, further comprising:

a cover which is adapted to protect the shell casing.

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4. An organic waste decomposition device, comprising:

a fermentation tank which includes an agitator capable of cutting an inputted organic waste and is adapted to decomposes the organic wastes using an added microorganism bacteria and discharges a carbonic acid gas including

10 water;

a cooling tank which is adapted to cool a carbonic acid gas including water which occurs in the fermentation tank, separates the same into water and a carbonic acid gas and discharges through an outlet pipe;

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a gas-liquid separator which is adapted to separate water and a carbonic acid gas flown in through the outlet pipe and to discharge the water through a first drainage pipe formed in a lower portion, and in which the carbonic acid gas returns to the fermentation tank through the exhaust pipe formed in an upper portion; and

5 a solid-liquid separator which is installed in the interior of the cooling tank and is adapted to filter a sludge from the water flown in through the first exhaust pipe and discharge through a second exhaust pipe connected to an outlet.

5. The device of claim 4, wherein said solid-liquid separator is formed of a
10 filter fabricating using a hollow fiber film.

6. The device of claim 4, wherein said gas-liquid separator includes an air inlet pipe adapted to aerate water flown in through the outlet pipe.

15 7. An automatic cleaning system of an organic waste decomposition device, comprising:

a hopper which is connected with a fermentation tank of an organic waste decomposition device using a suction line and is adapted to suck a remaining substance from the fermentation tank and store the same;

20 a twist screen which is adapted to filter a remaining substance supplied from the hopper and separates the same into a recyclable substance and a non-recyclable substance and discharge the same;

an eject hopper which is adapted to store a recyclable substance separated and discharged from the twist screen;

a cyclone which is connected with the eject hopper by a pressure line and is adapted to re-supply a recyclable substance supplied from the eject holler to a fermentation tank of an organic waste decomposition device and to return a part of the same to the hopper; and

a ring blower which is adapted to suck air from the hopper for thereby implementing a decreased pressure stare in the interior of the hopper and to generate a certain air pressure for transferring a recyclable substance from the eject hopper to the cyclone.

8. The system of claim 7, wherein said hopper includes an air supplier adapted to supply air for downwardly moving a remaining substance sucked in the hopper.

9. The system of claim 8, wherein said hopper includes a filter bag capable of eliminating a foreign substance from the air supplied through the air supplier.

10. The system of claim 7, wherein said hopper includes a rotary valve which is installed in a lower portion of the hopper and is adapted to adjust the amount of a remaining substance supplied to the twist screen.